



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,021	04/15/2004	Shannon V. Davidson	064747.1017	7500
45507 7590 10/15/2010 BAKER BOTTS LLP 2001 ROSS AVENUE 6TH FLOOR DALLAS, TX 75201-2980				
EXAMINER				
VO, TED T				
ART UNIT		PAPER NUMBER		
2191				
NOTIFICATION DATE		DELIVERY MODE		
10/15/2010		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTOmail3@bakerbotts.com

PTOmail4@bakerbotts.com

Office Action Summary

Application No.

10/825,021

Applicant(s)

DAVIDSON ET AL.

Examiner

TED T. VO

Art Unit

2191

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2010.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-24 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/IC)
Paper No(s)/Mail Date 7/15/10, 8/25/10, 10/08/10
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

1. This action is in response to the amendment filed on 07/29/2010.

Claims 1-24 remain pending in the application.

Information Disclosure Statement

2. An Examiner office action is a US Patent document. It is a communication document recorded and held within a file wrapper of patent application documentation. There is a section in form PTO-1449, "U.S. Patent Documents" used to place the contents of U.S patent documents. As seen in this section, it is only appropriate to place a US PATENT number, *a US publication number, or a US Application serial number*. The form PTO-1449 is not designed to put a format of any internal Examiner office actions. Therefore, if Applicants want to consider a US patent document, the appropriate cited content of it is a US Application Serial No., or a US. Publication number. And thus, all the Office Actions therein will be considered.

Generally, NPL is a non patent literature. A properly cited content pursuant to § 1.98 includes **author, title, publication date, and pertinent pages**. It should be noted that a content of NPL could be used as a prior art to reject against the application's claims. Since there has been no case using "an office action" as a prior art to reject an application, the cited content of an Examiner office action in NPL section is inappropriate, and is **not pursuant to § 1.98**.

The submission of any internal communication document of Examiner in the filing IDS will be put in the record of this application and considered by the Examiner, but its citation in the section in the form PTO- 1449 is lined though.

Response to Arguments

3. The office has rejected the claims 1-24 over Hovestadt and Keller et al. (hereinafter: Keller1) “Scheduling in HPC Resource Management Systems: Queuing vs. Planning” in view of Keller et al., “Anatomy of A Resource Management System for HPC Clusters” (hereinafter: Keller2) and in further view of Cisco Systems, “Cisco 12012 Gigabit Switch Router Switch Fabric Cards Replacement Instructions”.

The claim generally recites a blank method, that comprises,
“determining, using one or more computers, an original subset of a plurality of nodes, the original subset comprising nodes currently unallocated to a job, each node in the plurality of nodes comprising a switching fabric integrated to a card and at least two processors integrated to the card;”

Thus, it is understood that it looks at “a *subset*” of nodes that has not been allocated to a job.

Keller1 shows nodes as hardware resources (Sec. 3.1, p. 5). The nodes are used in scheduling for job assignment in HPC systems; some of the nodes are N nodes are unallocated (see p. 15, last paragraph: e.g. ‘the administrator establish’: “*determining*”, ‘N defines the number of nodes which are not allocatable..’: “*currently unallocated to a job*”. Keller1 does not explicitly mention

the nodes as comprising *a switching fabric integrated to a card and at least two processors integrated to the card...*

The term “resources” in Keller1 appears being the nodes including “processors” (see p. 9, sec. 3.3). Since Applicants attempt using a generic claimed language, “*switching fabric*”; and the adding limitation does not cause to yield an unexpected result in term of “*unallocated to a job*”, It requires a Kellers2 in order to support an obviousness of “*switching*” that is simply not necessary mentioned by Keller1.

Keller2 shows nodes are in a Cluster comprising Ethernet **Switch** (See Keller2: Figure 13, p. 16), where the nodes are processors (See in its Figure 12, p. 15, “CPU”); and the switching is used as node communications during executing a job (Keller2: i.e. scheduling, p. 6) for addressing the Applicants’ recitation: ***the switching fabric allowing node to node communication during execution of a job; selecting a job from a job queue and executing the selected job*** (Keller2: i.e. scheduling, p. 6) ***using one or more processors of one or nodes of the original subset***

Thus, it would be obvious to an ordinary skill of the art to combine because the structure of Keller1 and Keller2, where the N nodes in the Keller1 can be fit in the nodes showing the topology of Figure 12 and 13, because both Keller1 and Keller2 are only direct to one structure, but separately described. Thus, it would help to understand how resources are managed in HPC clusters. Thus, it would be obvious to combine to yield predictable results.

However, in many occasions, the ordinary in the art might confuse the term “switching fabric”, where the claims appear using the term without any limitations to cause the term to

produce new or unexpected result. It should be noted the claimed recitation that causes non-obviousness if its presence causes the new result in comparing to the prior art.

Thus, the obviousness for being combined under 103 is proper if an articulated reasoning with some rational underpinning to support the legal conclusion of obviousness'... [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007)(quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006)).

Therefore, with the prior art of Cisco, it shows a job scheduling are dealing with Switch Fabric (p. 3), where in this term, it explains

Switch fabric—The circuitry that carries the user traffic between line cards or between the RP and a line card. The switch fabric on the clock and scheduler card is identical to the switch fabric on the switch fabric card

Thus, the term "fabric" is merely a circuitry. The term "switch fabric" appears to be "circuitry that carries the user traffic". In the manner of Keller¹ and Keeler², the term "Ethernet Switch" is another expression of "switch fabric" which is necessary to be explained by Cisco for obviousness.

The claims are broad and being attempted of including the claimed languages that are not straight forward. Applicants tend to ask for the evidences; however, they provide no assistance or reasonable explanation to their claimed terms. Applicants' arguments have been reviewed; however, the arguments do not comply with 37 CFR 1.111(b) because they amount to a general

allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hovestadt and Keller et al. (hereinafter: Keller1) "Scheduling in HPC Resource Management Systems: Queuing vs. Planning", Proceedings of the 9th Workshop on Job Scheduling Strategies for Parallel Processing, Seattle, WA, pages: 1-19, 6-2003 in view of Keller et al., "Anatomy of A Resource Management System for HPC Clusters", 2001 (hereinafter: Keller2) and in further view of Cisco Systems, "Cisco 12012 Gigabit Switch Router Switch Fabric Cards Replacement Instructions",

As per Claim 1: Regarding limitation,

A method comprising:

Determining, using one or more computers, an original subset of a plurality of nodes, the original subset comprising nodes currently unallocated to a job, each node in the plurality of nodes comprising a switching fabric integrated to a card and at least two processors integrated to the card

(Keller1 discloses the limitation: see p. 15, last paragraph: e.g. 'the administrator establish': "determining", 'N defines the number of nodes which are not allocatable..': "currently unallocated to a job").

Note: Keller1 shows nodes as hardware but does not explicitly mention the nodes as comprising: *a switching fabric integrated to a card and at least two processors integrated to the card;*

However, Keller2 shows nodes are in Cluster comprising Ethernet Switch (See Keller2: Figure 13, p. 16: It would be obvious to an ordinary skill of the art to combine because the structure of Keller1 and Keller2 are only one structure, but separately described, thus it would help to understand how resources are managed in HPC clusters. Thus it would be obvious to yield predictable results).

Regarding,

the switching fabric allowing node to node communication during execution of a job; selecting a job from a job queue and executing the selected job (Keller2: i.e. scheduling, p. 6) ***using one or more processors of one or nodes of the original subset***

(Keller2" further discloses communication and selecting a job from queue: Figures 12-13, see P. 16. And in Figures 15-16: job execution selected via endpoint ports).

Keller1 reference teaches in a HPC an original subset of nodes being determined because they are unallocated. Keller2 shows in a HPC the nodes (in Figure 12) which are hardware-executable elements, comprising a switch to allow the elements are selectable and commutable; thus it is obvious to combined with Keller1's nodes which are being determined as unallocated.

However, the references do not mention the "switches" or cards as of "*switching fabric*", argued by Applicants.

Cisco Systems shows switch fabric, switch fabric card, used as the endpoints of Route processors (RP), where a RP executes a job received from such a switch via a scheduler (see Cisco. P. 3: three bold dots and "Switch Fabric Card", and see p. 10, fabric switch).

Thus, it is obvious to an ordinary in the art to include "switch fabric" that is mention in cards as disclosed by Cisco Systems into the HPC cluster as shown in Keller1 and Keller2. Such inclusion would be suitable for a replacement in components in which the Keller1 and Keller2 describe the endpoints as a generic switch/network card, and Cisco systems provides the detailed the switch fabric cards. The difference is only a change in shape or ingredient of the components. The replacement would be suitable for a choice of products which are selectable in the HPC.

As per Claim 2: Regarding, *The method of claim 1, wherein selecting the job comprises selecting the job from the job queue based on priority* (Keller1: See p. 3: sec. 2.1 Queuing Systems: queue priority), *the selected job comprising dimensions not greater than a topology of the original subset* (Keller1: See p. 15, last paragraphs: refer to Threshold, and N nodes are not allocatable).

As per Claim 3: Regarding, *The method of claim 2, wherein selecting the job from the job queue based on priority comprises: sorting the job queue based on job priority* (Keller1: p. 3, sec. 2.1); *selecting a first job from the sorted job queue* (Keller1: p. 3, sec. 2.1); *determining dimensions* (i.e. Network topology, or see Fig. 1 the axis of Available resources) *of the first job with the topology of the original subset* (Keller1: p. 14, in Mapping, see “static” and dynamic”, and p. 15: “N”); *and in response to the dimensions of the first job being greater than the topology of the original subset* (Keller1: See Fig. 1 and p. 15: “system wide node limit”), *selecting a second job from the sorted job queue* (i.e. ability of the queue systems for using free resources with waiting resource requests (in p. 3), ability of co-allocation, of grouping different dependency graphs of the queue system and planning (sec. 2.1 and 2.2)).

As per Claim 4: Regarding (refer to Keller1 reference), *The method of claim 2, wherein the dimensions of the first job are based, at least in part, on one or more job parameters and an associated policy* (i.e. resources/against time axis as mentioned in p. 3:1-3).

As per Claim 5: Regarding (refer to Keller1 reference), *The method of claim 2, further comprising dynamically allocating a job space from the original subset based, at least in part, on the dimensions of the job, wherein executing the selected job comprises executing the selected job using the job space* (See sec. 3.2, start at p.6, and noted that the queue systems/planning has an ability to allocate job spare as using the free recourses for waiting request resources).

As per Claim 6: Regarding, *The method of claim 1, wherein the plurality of nodes comprises a first plurality* (Keller1: see node in clusters in p. 1, different dependency graphs, p. 16) *and the*

method further comprises: determining that dimensions of the selected job are greater than a topology of the first plurality (Keller1: i.e. number N and threshold T (p. 15));

selecting one or more nodes from a second plurality of nodes (Keller1: See Fig. 1, and last paragraph in p. 15), *each of the nodes in the second plurality of nodes comprising a switching fabric integrated to a card and at least two processors integrated to the card* (Keller2: See Grammar 3.2.1, p. 15 and Figure 13, p. 16);

and adding the nodes selected from the second plurality to the original subset to satisfy the dimensions of the selected job (Keller1: See the sec. 2.1 and 2.2).

As per Claim 7: Regarding, *The method of claim 6, further comprising returning the nodes selected from the second plurality to the second plurality* (Keller1: see node in clusters in p. 1, different dependency graphs, p. 16, i.e. another job/ node is selected in queuing)

As per Claim 8: Regarding, *The method of claim 1, further comprising; determining that a second job that was executing on a second subset of the plurality of nodes has failed* (Keller1: See last paragraph in p. 15, or the description of System Wide Node Limit (i.e. SWNL), for the case when the user requests a number of nodes T+N greater than the threshold T); *adding the second subset to the original subset; and adding the failed job to the job queue* (the SWNL defines automatically the number N is not allocatable notes).

As per Claims 9-16: See rationale addressed in the rejection of Claims 1-8, respectively.

As per Claims 17-24: See rationale addressed in the rejection of Claims 1-8, respectively.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted T. Vo whose telephone number is (571) 272-3706. The examiner can normally be reached on 8:00AM to 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Y. Zhen can be reached on (571) 272-3708.

The facsimile number for the organization where this application or proceeding is assigned is the Central Facsimile number 571-273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR)

Art Unit: 2191

system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TTV

October 11, 2010

/Ted T. Vo/

Primary Examiner, Art Unit 2191